POLYCHAETA OF THE PULICAT LAKE (TAMIL NADU)[1]

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(With four plates)

Polychaete fauna of the Pulicat Lake (Tamil Nadu) consisting of 25 species belonging 23 genera and 13 families, 20 of which are new records to this lake and two new to the brackishwaters of India are described, together with their distribution in the lake, and the taxonomic keys for all of them.

Introduction

Polychaetes constitute a major component of the bottom fauna of a lagoon like the Pulicat Lake as Raman *et al.* (1975) have shown, and they contribute an important link in the food-webs of a brackishwater ecosystem.

Among the major brackishwater bodies of India, the polychaete fauna of the Gangetic Delta and of the Chilka Lake have been thoroughly investigated, but no systematic work on the polychaetes of the Pulicat Lake, which is the second largest brackishwater body in India has been attempted.

The present survey was conducted during the years 1973-1978. As the Pulicat Lake is a major brackishwater fishing centre in Tamil Nadu, a knowledge of the polychaete fauna of this lake would be helpful from both the academic as well as from the fisheries points of view.

Topography of the Pulicat Lake. Russel (1898), Hornell (1910), Chacko *et al.* (1953), Krishnamurthy & Rao (1970), Joel (1973), Raman *et al.* (1975), Paul Raj (1976) and Jhingran (1977) have earlier described the topography of the Pulicat Lake.

Pulicat Lake (Lat. 13°24′ to 13°47′N and Long. 80°2′ to 80°16′E) covers an average area of about 461 sq. kilometres. The average depth of the lake is about 1.5 metres and the maximum depth is about 7.0 metres. The lake, at its southern end, close to Pulicat Town, opens into the Bay of Bengal by a narrow mouth (pass). In addition to this, there is also another seasonal pass near Duggirajapatnam (northernmost point). In the northern part of the lake, there are two large islands, Venadu and Irakkam (Plate 1) and a much smaller one called Kuruvithittu. On the eastern side, the Sriharikota Island extends north to south all along, as a narrow strip of land between the lake and the Bay of Bengal. After the establishment of the S.H.A.R. on the Sriharikota Island it is connected with Sulurpet Town on the mainland by a cement road. The Buckingham Canal runs parallel to the entire length of the lake and it opens into the lake here and there.

Hydrology and substrata of the Lake. Hornell (1910), Chacko *et al.* (1953), Michael (1970), Joel (1973), Srinivasan & Pillay (1972), Krishnamurthy (1973), Raman *et al.* (1975) and Paul Raj (1976) have described the hydrology of the Pulicat Lake.

The interesting feature of the lake is that during the flood season in November-December, the salinity is extremely low, but during the summer and post-summer months (April to September) it is hypersaline. Hornell (1910) observed fine sandy bottom along the shores

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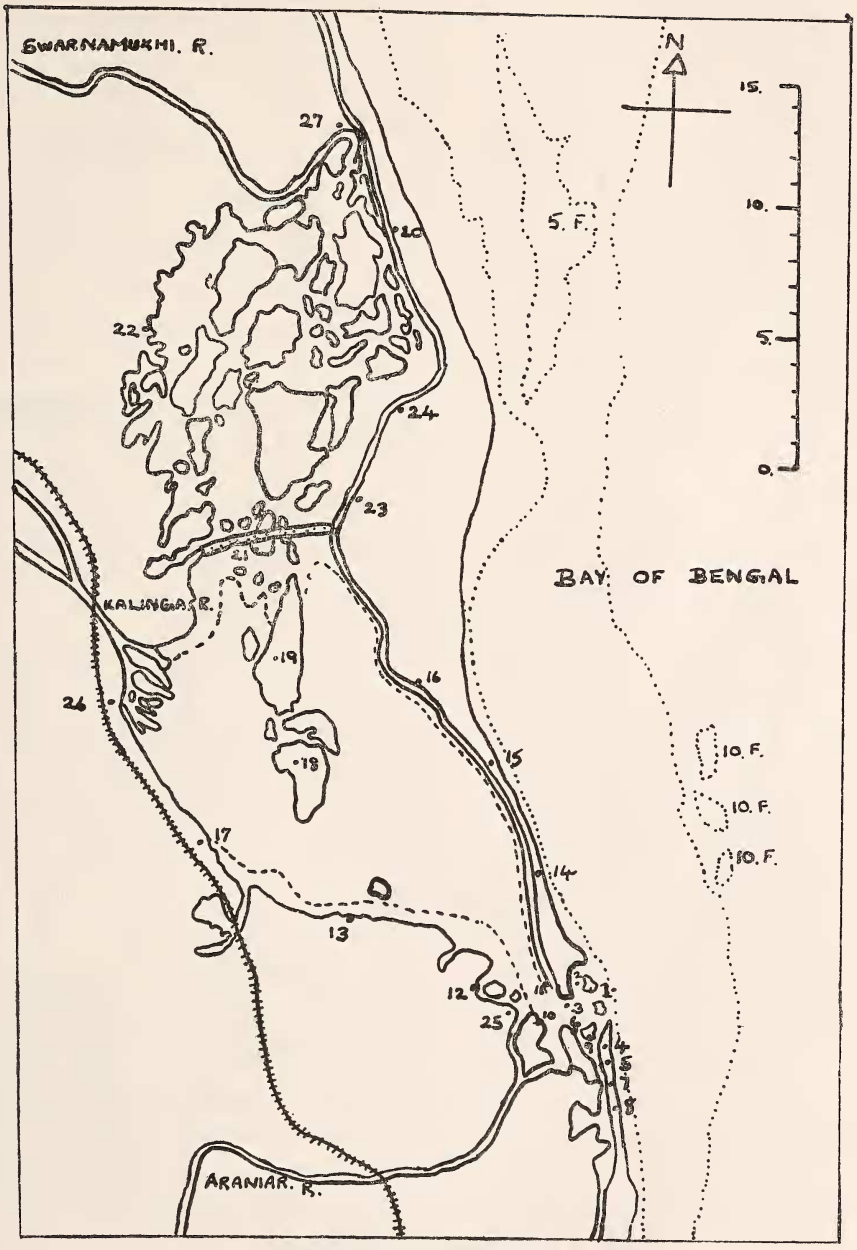
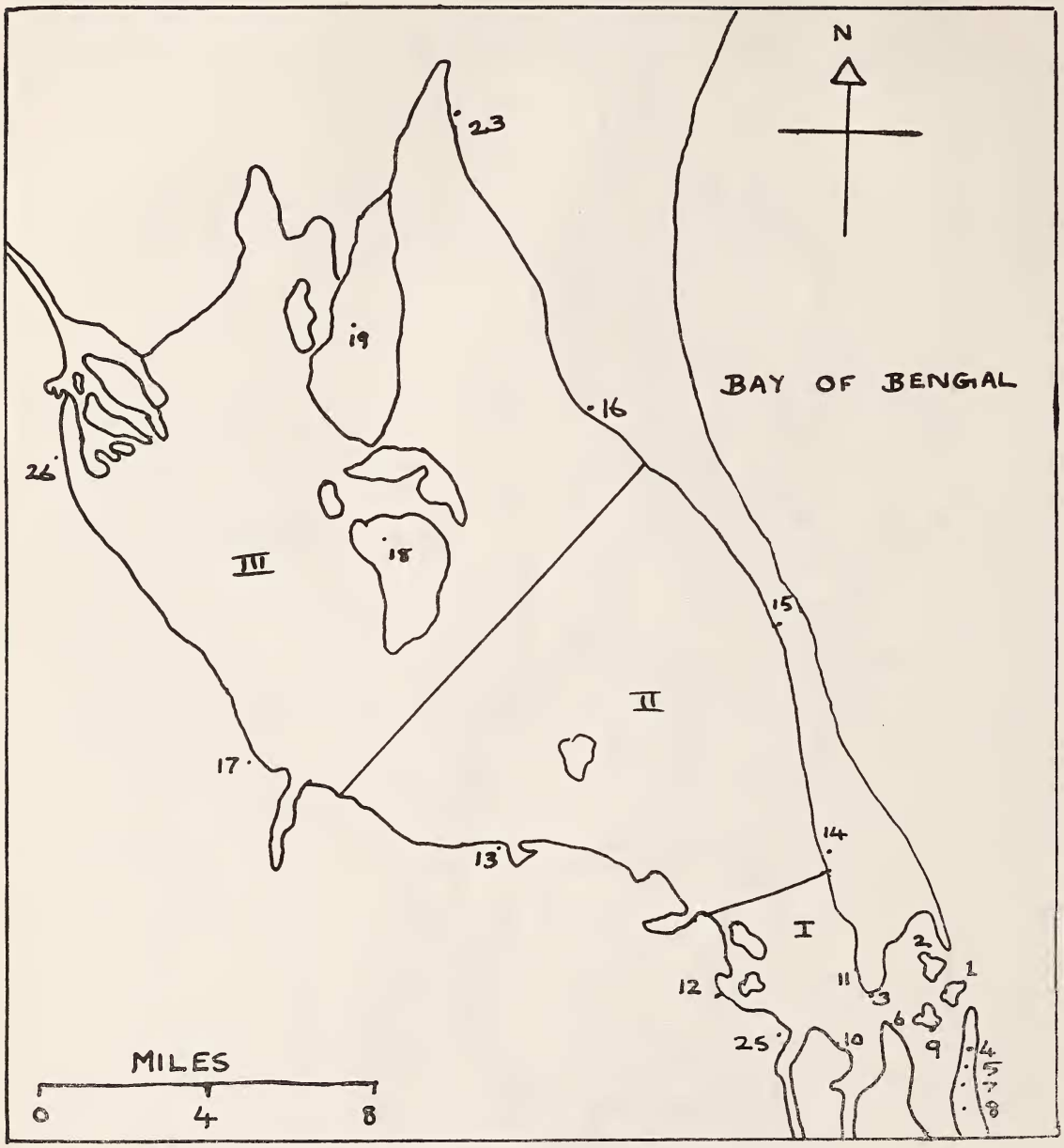


Map of Pulicat Lake.

1. Pulicat Pass; 2. Karimanal; 3. Dhonirevu; 4. Gunankuppam; 5. Lighthousekuppam; 6. Kottaikuppam lock; 7. Koraikuppam; 8. Sattankuppam; 9. Edamani; 10. Kulathumedu; 11. Moosamani lock; 12. Annamalaicheri; 13. Chunnambukulam; 14. Arangam; 15. Pulincheri; 16. Zonangipalam; 17. Arambakkam; 18. Irrakkam; 19. Venadu; 20. Berupet; 21. Atakanitippa; 22. Malan; 23. Sriharikotta; 24. Royduruah; 25. Avarivakkam; 26. Tada; 27. Duggirajapatnam.



Map of Pulicat Lake Showing zones.

Zone I: Sand with little admixture of mud.
Zone II: Sand and mud with equal proportions with patches of weeds.
Zone III: Mud.
1. Pulicat Pass; 2. Karimanal; 3. Dhonirevu; 4. Gunankuppam; 5. Lighthouse-kuppam; 6. Kottaikuppam lock; 7. Koraikuppam; 8. Sattankuppam; 9. Edamani; 10. Kulathumedu; 11. Moosamani lock; 12. Annamalaicheri; 13. Chunnambukulam; 14. Arangam; 15. Pulincheri; 16. Zonangipalam; 17. Arambakkam; 18. Irrakkam; 19. Venadu; 23. Sriharikotta; 25. Avarivakkam; 26. Tada.

of the lake near the lake-mouth (pass). Krishnamurthy (1971) observed three zones, based on the nature of the substratum, one zone characterised by the predominance of sand in the substratum, with little admixture of mud, a second zone having sand and mud in equal proportions with patches of weeds, and a third zone consisting entirely of mud. Of these three zones, the first and the second zones are rich in flora and fauna, and polychaetes particularly are plenty in the second zone (Plate 2).

Review of previous work on Polychaeta of India. The earliest work on the Polychaeta of the Indian region is that of Willey (1905), describing collections from the Gulf of Mannar. Later, Potts (1909) studied the Polychaeta of the Indian Ocean. Southern (1921) and Gravely (1927) described the Polychaeta occurring in the Krusadai Island, Chilka lake, Gangetic delta and Cochin backwaters. Bindra (1927) studied the polychaetes belonging to the genus *Eurythoe* from Karachi. Aziz (1938) studied the polychaetes of Karachi. Brackishwater polychaetes of Madras were studied by Panikkar & Aiyar (1937). This was followed by the contributions of Fauvel (1930, 1930a, 1932 and 1940), which culminated in 1953 in the publication of his comprehensive account of the Polychaeta of India in the FAUNA OF BRITISH INDIA series. He described 283 species from the coasts of India, which includes 47 brackishwater species and 236 marine forms. Day (1962) reviewed the list of the Polychaeta in the Western Indian Ocean. Polychaeta from the south-east coast of India were studied by Ghosh (1963). Some polychaetous annelids from the Andaman waters were studied by Tampi & Rangarajan (1964). Polychaetes from the Cochin harbour area were studied by Cheriyan (1966). Polychaeta from Maharashtra and Goa were studied by Parulekar (1971). More recently, the polychaetes of the Indian Ocean were catalogued by Hartman (1974).

Concerning the brackishwater polychaetes particularly of India, Southern (1921) in his classical work on the Fauna of the Chilka Lake described about 20 species of brackishwater polychaetes. Brackishwater polychaetes of the Gangetic Delta and Cochin Backwaters were also described by Southern (1921). Sewell (1934) described the brackishwater polychaetes of the salt lakes of Calcutta (Hugli river). Panikkar & Aiyar (1937) described the brackishwater polychaetes of the Adyar and Coovum estuaries near Madras. Alikunhi (1941, 1942, 1943, 1946, 1947, 1948 and 1951) studied the interstitial polychaetes of Madras.

Chacko *et al.* (1953) merely listed five species of Polychaeta from the Pulicat Lake, namely *Lycastis indica* Southern, *Nereis chilkaensis* Southern, *Marphysa gravelyi* Southern, *Lumbriconereis polydesma* Southern and *Polydora kempi* Southern. Krishnamurthy (1963) described six brackishwater polychaetes from the Adyar estuary, Madras. Balasubramanyam (1964), while describing the fauna of the Vellar estuary (Porto Novo) listed 28 species of polychaetes. Radhakrishna & Ganapati (1967) worked out the fauna of the Godavari estuary describing about 19 polychaete species.

In addition to the above faunistic surveys, some work has been done on the other aspects like anatomy, behaviour, reproductive biology, ecophysiology and biochemistry of some selected polychaetes. Ranganathan (1942) worked out the anatomy of *Glycera embranchiata.* Tampi (1946) worked out the structure of the eyes and tube-building organs of some selected polychaetes. Krishnan (1952) studied the nephridia of Nereidae and also the development of *Diopatra variabilis.* Anatomy and development of *Dasychone cingulata* was studied by Thomas (1955). Physiological studies on *Marphysa gravelyi* were conducted by Krishnamurthy (1962, 1963 and 1968).

Salinity tolerance and weight regulation in *Lycastis indica* were studied by Mary (1965). Table 1 compares the occurrence of the brackishwater polychaetes of India and their distribution.

Taxonomic methods. Southern (1921) has given more emphasis to parapodial structures rather than to the appendages of the anterior end. Fauvel (1953) has given more emphasis to the head morphology (prostomium, eyes, tentacles, tentacular cirri, gills, proboscis with its jaws and denticles). The keys given herein to identify the families of the polychaetes of the Pulicat Lake are based mainly on the head structures, whereas the keys for generic and specific levels are based on head structures as well as on parapodial characters.

Laboratory maintenance of polychaetes. A number of attempts were made to maintain polychaetes alive in the laboratory at the Madras Christian College, Tambaram, about 80 km inland from the Pulicat Lake. Most often the worms survived only for a week or so. The following method was successfully evolved subsequently to keep the worms alive for more than six months, away from their natural habitat.

Polychaete worms collected from the Pulicat Lake were transported by rail and road in about 4 hours and were brought to Tambaram in glass bottles containing the lake water. A perforated lid was used to allow ventilation. The lower halves of the glass bottles were filled with the bottom mud from the lake and the rest was filled with the lake water. The worms were seen to be readily burrowing into the mud at the bottom. After arriving at the inland lab, the worms, along with the lake water and mud, were transferred to glass troughs of five-litre capacity. Two litres of the lake mud at the bottom and two litres of the lake water were used in each glass trough. Dark slushy mud was noticed to decompose fast, hence shore sand was found to be ideal. The water in the glass troughs was constantly aerated, to avoid oxygen depletion. Salinity of the water was maintained around 35.01‰ by adding distilled water and sea water as may be required. The optimum salinity was noted to be 30±5‰. The dissolved oxygen content in the water was on the average 3.684 ppm. Temperature of the water was on an average 26°C. The worms were able to live well in varying temperatures, the optimum temperature being 26±5°C. In each such glass trough, about 25 worms were stocked. Species maintained at the inland lab were *Marphysa gravelyi, Nereis chilkaensis, Heteromastus similis* and *Euclymene annandalei.* If the number in each trough was raised above 25, mortality was noticed and this may be due to overcrowding in a small container. Stocking density may be 10-12 worms per litre.

Since most of the worms are detritus feeders, no supplemental food was supplied. They were presumed to be feeding on the detritus and on the plankton available in the water. These worms under such laboratory conditions survived for more than six months, so that they could be used for the present work.

Materials and Methods

Polychaetes were collected from nearly 27 stations representing all possible biotopes of the lake. Fishermen of the Pulicat Lake also collect polychaetes as bait for angling. Two methods are in vogue.

(i) *Intertidal collection.* The body fluids of crabs like *Portunus* sp., *Uca* sp., by breaking their appendages are spilt over the sandy shore. This odour of the crab seems to attract the worms to come out of their burrows. They are then gently caught by their heads and pulled out of their burrows.

(ii) *Bottom collection.* The villagers use a

TABLE 1

DISTRIBUTION OF POLYCHAETES IN BRACKISHWATER BODIES IN INDIA

Brackishwater polychaetes of India	Pulicat Lake	Salt Lakes of Calcutta	Chilka Lake	Godavary Estuary	Madras Brackishwaters	Vellar Estuary	Vembanad Lake
1. *Harmothoe ampullifera*	+	–	–	+	–	–	+
2. *Leonira japonica*	–	–	–	–	–	+	–
3. *Pisionidens indica*	+	–	–	–	–	+	–
4. *Pisione complexa*	+	–	–	–	–	–	–
5. *Hesione pantherina*	–	–	–	+	–	–	+
6. *Hesione intertexta*	+	–	–	–	–	+	–
7. *Eteone barantollae*	+	+	–	–	–	–	–
8. *Ancistrosyllis constricta*	–	–	+	–	+	+	–
9. *Tomopteris elegans*	–	–	–	–	–	+	–
10. *Lycastis indica*	+	+	+	–	+	+	+
11. *Tylonereis fauveli*	+	–	+	–	–	+	–
12. *T. bogoyawlenskyii*	–	–	–	–	–	–	+
13. *Nereis chilkaensis*	+	–	+	–	+	+	+
14. *N. glandicincta*	–	+	+	–	+	+	+
15. *N. reducta*	–	–	+	–	–	–	–
16. *N. cavifrons*	±	+	–	–	–	–	–
17. *N. cricognatha*	–	+	–	–	–	–	–
18. *N. chingrighattensis*	–	+	–	–	–	–	–
19. *Perinereis cavifrons*	–	–	–	–	–	–	+
20. *P. marjorii*	–	–	+	–	–	–	–
21. *P. cultrifera*	–	–	–	–	–	–	+
22. *Dendronereis aestuarina*	–	+	+	+	–	–	+
23. *D. arborifera*	–	–	–	+	–	–	–
24. *D. heteropoda*	–	+	+	–	–	–	+
25. *Nephthys polybranchia*	–	–	+	–	+	–	–
26. *N. oligobranchia*	–	+	+	–	–	+	–
27. *Goniada emerita*	–	–	–	–	–	–	+
28. *Glycera alba*	+	–	+	–	–	–	+
29. *Glycinde oligodon*	–	–	+	–	–	–	–
30. *Onuphis eremita*	–	–	–	–	–	+	–
31. *Diopatra neapolitana*	+	–	+	+	+	+	+

TABLE 1 (CONTD.)

32.	*Marphysa gravelyi*	+	–	+	+	+	+	+
33.	*M. sanguinea*	–	–	–	–	–	–	+
34.	*M. stragulum*	–	–	–	–	–	–	+
35.	*Lumbriconereis polydesma*	+	–	+	–	+	+	–
36.	*L. simplex*	+	–	+	–	–	+	+
37.	*L. pseudobifilaris*	–	–	–	+	–	–	+
38.	*L. heteropoda*	–	–	–	+	–	–	+
39.	*Scoloplos marsupialis*	–	–	+	–	–	–	–
40.	*Scoloplos indica*	–	–	–	–	+	–	–
41.	*Nerine cirratulus*	+	–	–	–	–	+	–
42.	*Polydora ciliata*	+	–	–	–	+	–	–
43.	*P. hornelli*	–	–	+	–	–	–	–
44.	*P. kempi*	–	+	+	–	+	–	–
45.	*Spio bengalensis*	–	+	–	–	–	+	–
46.	*Prionospio krusadensis*	+	–	–	–	–	–	–
47.	*P. polybranchiata*	–	–	–	–	–	+	–
48.	*P. cirrifera*	–	–	–	+	+	–	–
49.	*Myriochele picta*	–	–	+	–	–	–	–
50.	*Cossura delta*	–	–	–	–	–	+	–
51.	*Capitella* sp.	–	–	–	–	+	–	–
52.	*Heteromastus similis*	+	–	+	–	+	+	–
53.	*Paraheteromastus tenuis*	–	–	–	–	–	+	–
54.	*Mastobranchus indicus*	–	+	+	–	–	+	–
55.	*Barantolla sculpta*	+	+	+	–	–	–	–
56.	*Branchiocapitella singularis*	+	–	–	–	–	–	–
57.	*Euclymene annandalei*	+	–	+	+	–	+	–
58.	*E. insecta*	+	–	–	–	–	–	–
59.	*Sternaspis costata*	–	–	+	–	–	–	–
60.	*Pectinaria crassa*	–	–	–	–	–	+	–
61.	*Amphicteis gunneri*	+	–	–	–	–	–	–
62.	*Loimia medusa*	–	–	–	+	–	–	–
63.	*Pista indica*	–	–	–	–	–	–	+
64.	*Sabellaria spinulosa*	–	+	–	–	–	–	–
65.	*S. pectinata*	–	+	–	–	–	–	–
66.	*Laonome indica*	+	–	+	–	–	+	–
67.	*Potamilla leptochaeta*	+	+	+	+	–	–	–
68.	*Fabricia spongicola*	–	–	+	–	–	–	–
69.	*Hydroides norvegica*	+	–	–	–	+	–	–
70.	*Ficopomatus macrodon*	–	–	+	–	–	–	+
71.	*Mercierella enigmatica*	–	–	–	–	–	+	–

special teak plank, like a cricket-bat, made just for collecting polychaetes. The plank is about 60 to 75 cm long and about 15 cm broad, and about 10 cm. in thickness. The top has a handle, but the bottom is pointed. After choosing the proper habitat of polychaetes, they insert this plank deep into the soft ooze almost up to the handle, incline it outwards and rotate it in a semi-circle, thus scooping out the bottom mud. Polychaetes dislodged from such mud are collected by handpicking.

Polychaetes associated with oyster-shells were collected by dislodging the shells with a chisel and hammer. Interstitial polychaetes were collected by "Corer" as designed by McIntyre (1968).

Key for Identification

(a) key to identify Errantia and Sedentaria

Body vermiform, undivided into two regions; all segments nearly alike; Free-living.....ERRANTIA
Body divided into two distinct regions, thorax and abdomen; usually tubicolous .....SEDENTARIA

(b) key to identify families of Errantia

1. Elytra present on a limited number of segments only; the posterior segments carry cirri ..... Aphroditidae
   Elytra absent 2
2. Proboscis armed with four teeth; prostomium fused with buccal segment; feet uniramous ..... Pisionidae
   Proboscis unarmed 3
3. Tentacles four to five; dorsal and ventral cirri foliaceous; setae compound. ..... Phyllodocidae
   Dorsal cirri long and moniliform 4
4. Head with two pairs of eyes; two or three tentacles; palps present or absent. ..... Hesionidae
   Proboscis with paragnaths. 5
5. Proboscis armed with a single pair of toothed jaws; tentacles two; parapodia biramous ..... Nereidae
   Proboscis armed with two pairs of jaws tentacles four or more; parapodia biramous or sesquiramous 6
6. Prostomium conical, ringed with four small tentacles; palps absent. ..... Glyceridae
   Prostomium distinct and well developed with tentacles and palps; proboscis complex. ..... Eunicidae

(c) key to identify families of Sedentaria

1. Body clearly divided into regions 2
   Body not clearly divided into regions; prostomium without tentacles; palps without suckers; dorsal and ventral cirri foliaceous; hooded hooked setae. ..... Spionidae
2. Prostomium conical without appendages; proboscis unarmed; dorsal and ventral cirri absent. ..... Capitellidae
   Prostomium not conical 3
3. Prostomium rimmed with a cephalic plate; anal funnel with cirri. No gills ..... Maldanidae
   Prostomium trilobed or hidden 4
4. Prostomium trilobed, buccal tentacles long and retractile into the mouth; three to four pairs of subulate branchiae inserted on the anterior segments. ..... Ampharaetidae
   Prostomium hidden; with or without operculum 5
5. With an operculum; a thoracic membrane; tube calcareous ..... Serpulidae
   Without operculum; no thoracic membrane; tube membranous. ..... Sabellidae

(d) key to identify genera and species

Family 1. Aphroditidae

Eyes four; prostomium bilobed; three tentacles; dorsal setae stouter than the ventral with bidentate tips; sessile; elytra fringed with small papillae; ventral lamellae conspicuous ..... *Harmothoe ampullifera*

Family 2. Pisionidae

Presence of two non-serrated buccal spines between the two palps with genital papillae in the 35th segment. ..... *Pisione complexa*
Absence of buccal spines and palps longer than dorsal cirri of the buccal parapodia. ..... *Pisionidens indica*

Family 3. Phyllodocidae

Prostomium with two pairs of tentacles and two pairs of tentacular cirri; proboscis with soft rows of papillae. ..... *Eteone barantollae*

FAMILY 4. HESIONIDAE

Prostomium with two tentacles; palps absent; proboscis unarmed; paired brown spots on each intersegmental line ..... *Hesione intertexta*

FAMILY 5. NEREIDAE

1. Feet uniramous; eyes arranged in a line; dorsal setae absent. ..... *Lycastis indica*
   Feet biramous. 2
2. Paragnaths present; dorsal cirrus longer and larger than ventral cirrus; no dorsal homogomph falcigerous bristles in posterior feet. .... *Nereis chilkaensis*
   Paragnaths absent; ventral setigerous lobe bilobed in few segments; jaws with 12 teeth. .... *Tylonereis fauveli*

FAMILY 6. EUNICIDAE

1. Tentacular cirri present; tentacles with cirratophores ..... *Diopatra neapolitana*
   Tentacular cirri absent 2
2. Gills present, pectinate; comb setae arranged in middle region of the body.....*Marphysa gravelyi*
   Gills absent. 3
3. Gills and eyes absent; feet with wing capillary setae and hooks absent. .. *Lumbriconereis simplex*
   Hooks present ..... *Lumbriconereis polydesma*

FAMILY 7. GLYCERIDAE

Gills inserted on the dorsal edge of the foot; proboscis with four long jaws; Dorsal setae simple capillary and ventral setae compound and winged; posterior lobes unequal. ....*Glycera alba*

FAMILY 8. SPIONIDAE

Prostomium conical; bidentate; hooded hooks; gills in anterior segments; anal cup present .... *Nerine cirratulus*
Prostomium rounded; gills pinnate; hooded hooks with four teeth; median anal cirrus present .... *Prionospio krusadensis*
Prostomium rounded, but slightly notched in front and prolonged up to the 3rd segment ... . *Polydora ciliata*

FAMILY 9. CAPITELLIDAE

1. Thorax with seven segments; dorsal and ventral hooks begin from tenth segment; gills present in posterior segments ..... *Branchiocapitella singularis*
   Thorax with more than seven segments 2
2. Thorax with 11 segments; segments one to five capillary setae; segments six to 11 long hooks; short hooks in the rest ..... *Heteromastus similis*
   Thorax with 12 segments; segments two to seven capillary setae; eight to 12 long crochets; short crochets in the rest ..... *Barantolla sculpta*

FAMILY 10. MALDANIDAE

Head with cephalic plate; anal segment with anal cirri; total segments 19. Ocelli present in cephalic plate; median ventral cirrus in caudal funnel stouter than others ..... *Euclymene annandalei*
Absence of ocelli in cephalic plate; median ventral cirrus in caudal funnel longer than others ..... *Euclymene insecta*

FAMILY 11. AMPHARETIDAE

Thorax 17 segments; gills four pairs and arranged on either side of the first two segments..... ..... *Amphecteis gunneri*

FAMILY 12. SABELLIDAE

Thorax six segments; no pickaxe-shaped setae; ranchiae four pairs ..... *Laonome indica*
Thorax seven segments; presence of pickaxe-shaped setae; Branchiae six pairs .... *Potamilla leptochaeta*

FAMILY 13. SERPULIDAE

Operculum compound; funnel shaped with a crown of horny spines; radii of operculum sharp with more than one pair of lateral processes ..... *Hydroides norvegica*

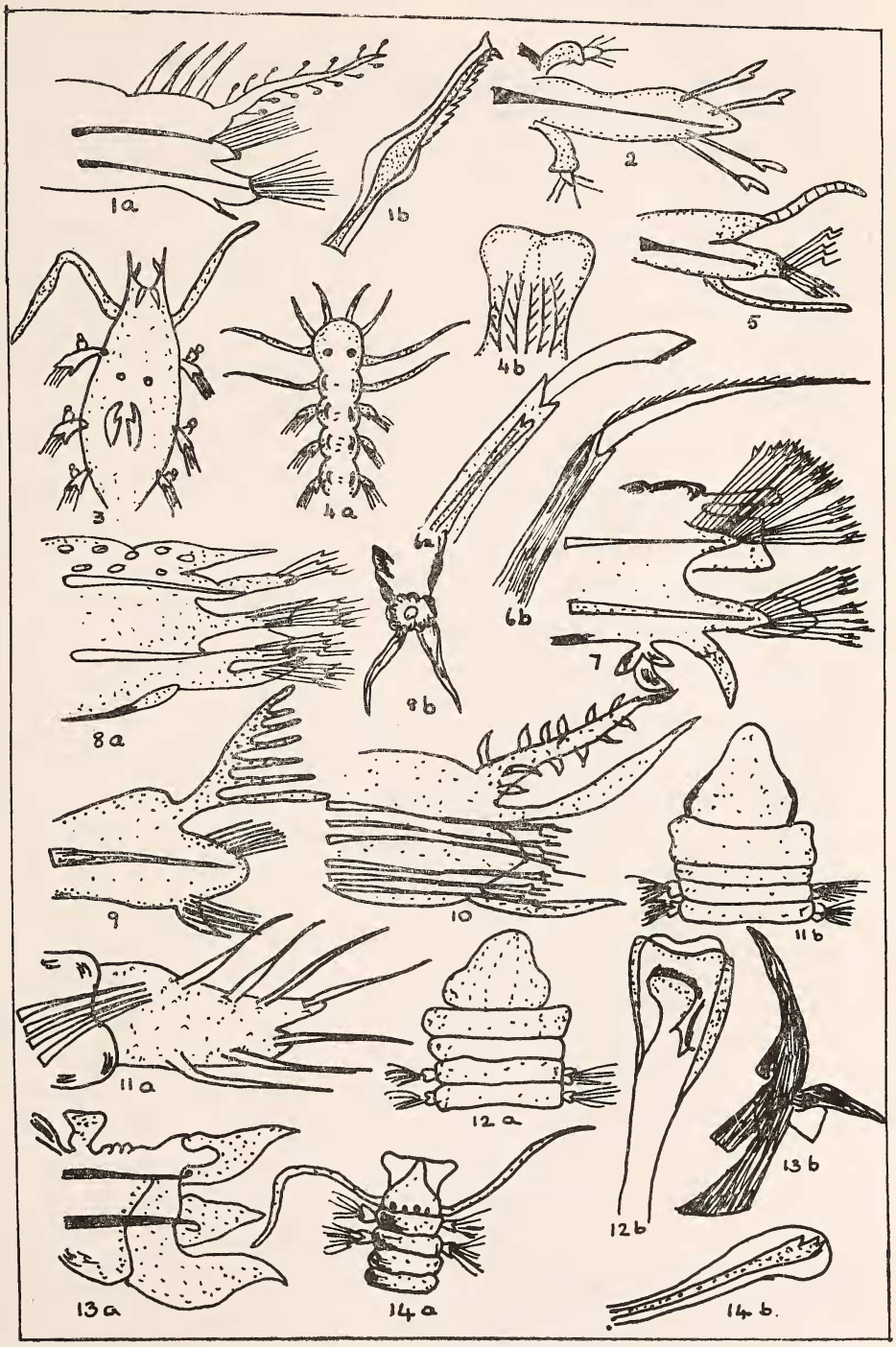
TAXONOMY

ERRANTIA

FAMILY APHRODITIDAE

Species 1. **Harmothoe ampullifera** (Grube) 1878 (Plate 3, figs. 1a & 1b)

Polynoe ampullifera Grube 1878, p. 35; *Lepidonotus ampullifera* Gravier 1901, p. 214; *Harmothoe ampullifera* Fauvel 1911, p. 368; *Paralepidonotus ampullifera* Horst 1917, p. 76; *Harmothoe ampullifera* Fauvel 1927, p. 414; 1930a, p. 8; 1930b, p. 508; 1932, p. 22; 1940, p. 254; 1953, p. 43-44; De Silva 1965, p. 538-539; Pillai 1965, p. 117-119. Parulekar 1971, p. 732.



(*see* captions overleaf)

Captions to Plate 3

Harmathoe ampullifera Grube, 1878
Fig. 1a — Median foot;
Fig. 1b — Ventral seta.

Pisionidens indica Aiyar & Alikunhi, 1940
Fig. 2 — A typical parapodium.

Pisione complexa Alikunhi, 1947
Fig. 3 — Anterior end, Dorsal view.

Eteone barantollae Fauvel, 1932.
Fig. 4a — Head, Dorsal view;
Fig. 4b — Proboscis with rows of papillae.

Hesione intertexta Grube, 1878
Fig. 5 — Median parapodium.

Lycastis indica Southern, 1921
Fig. 6a — Heterogomph falciger from median parapodium;
Fig. 6b — Homogomph spiniger from same parapodium.

Nereis chilkaensis Southern, 1921.
Fig. 7 — Median right foot.

Tylonereis fauveli Southern, 1921
Fig. 8a — 5th right foot;
Fig. 8b — posterior end, Dorsal view.

Marphysa gravelyi Southern, 1921
Fig. 9 — Branchiate foot.
Diopatra neapolitana Delle Chiaje, 1941
Fig. 10 — 10th right foot with gills.

Lumbriconereis simplex Southern, 1921
Fig. 11a — Anterior foot;
Fig. 11b — Anterior end, Dorsal view.

Lumbriconereis polydesma Southern, 1921
Fig. 12a — Anterior end, Dorsal view;
Fig. 12b — Tip of crochet from median parapodium.

Glycera alba Rathke, 1843
Fig. 13a — 8th right foot;
Fig. 13b — jaw enlarged.

Nerine cirratulus Delle Chiaje, 1828.
Fig. 14a — Anterior end, Dorsal view;
Fig. 14b — Ventral bidentate hooded hook.

Habitat. Collected from within the crevices of oyster shells.

Description. Length 25 to 35 mm, including parapodia on either side. Elytra 15 pairs, overlapping each other posteriorly. Total number of parapodia 37 pairs. Dorsal setae slightly curved and serrated. Ventral setae long and bidentate. Tentacles black in colour.

Occurrence in Indian waters. Madras, Rameswaram and Pamban (coral reefs).

Distribution outside Indian waters. Philippine Islands, Persian Gulf and Red Sea.

Remarks. This species is closely related to *Harmothoe imbricata,* but it differs from that in having elongated nephridial papillae and ventral lamellae.

Family Pisionidae

Species 2. **Pisionidens indica** Aiyar & Alikunhi 1940 (Plate 3, fig. 2)

Pisionella indica Aiyar & Alikunhi 1940, p. 89; *Fauviella pulchra* Tebble 1953, p. 938; *Pisionidens pulchra* Day 1957, p. 68; *Pisionidens indica* Day 1962, p. 636.

Habitat. Pulicat Mouth (Interstitial).

Description. 7 to 12 mm in preserved condition. Body consists of about 35 segments. Prostomium highly reduced. Eyes not clearly visible. Parapodia uniramous.

Occurrence in Indian waters. Indian Ocean and Bay of Bengal.

Distribution outside Indian waters. Durban and West Indian Ocean.

Remarks. The forms described here are not fully grown. In fully grown forms the third to sixth parapodia are non-setigerous, setae present from the seventh segment only. However in this juvenile, almost all the parapodia bear compound as well as simple setae.

Species 3. **Pisione complexa** Alikunhi 1947 (Plate 3, fig. 3)

Pisione complexa Alikunhi 1947, p. 105; Rao & Ganapathi 1968, p. 110.

Habitat. Collected from Pulicat Pass (Interstitial).

Description. 6 to 10 mm long, possessing about 40 segments. Two non-serrated buccal spines present between the two palps. A pair of eyes present. Parapodia uniramous. Each parapodium bears two long acicula and five setae, both of simple and compound types. The anal segment bears a pair of long anal cirri. Genital papillae are seen in the 35th segment.

Occurrence in Indian waters. Madras beach, Waltair coast.

Distribution outside Indian waters. Bay of Bengal.

Remarks. Out of the 15 worms collected only 4 worms possess anal cirri. In all the others, the anal cirri are absent.

Family Phyllodocidae

Species 4. **Eteone barantollae** Fauvel 1932 (Plate 3, figs. 4a & 4b)

Eteone barantollae Fauvel 1932, p. 72; 1953, p. 127.

Habitat. Collected from Pulicat Pass area, along with *Pisione complexa* and some nematodes.

Description. Length 10 to 15 mm; breadth 1 to 1.5 mm. The worm possesses about 90 segments. A pair of eyes present. Proboscis bears rows of papillae. Simple setae absent. Paired anal cirri present.

Occurrence in Indian waters. Saltwater lakes near Calcutta.

Distribution outside Indian waters. Not known.

Remarks. Only two worms were collected by Fauvel (1932 & 1953) who described that there are five rows of papillae on the proboscis.

But in the present collection, the papillae are not arranged in five definite rows, but are seen to be rather irregularly arranged.

Family Hesionidae

Species 5. **Hesione intertexta** Grube 1878 (Plate 3, fig. 5)

Hesione intertexta Grube 1878, p. 102; Chamberlin 1919, p. 188; Monro 1926; p. 311; Pruvot 1930, p. 29; Fauvel 1932, p. 60; Monro 1937, p. 270; Fauvel 1953, p. 105; Tampi 1964, p. 104.

Habitat. Collected from the crevices of oyster shells.

Description. Prostomium bilobed. Two pairs of eyes present. A pair of tentacles and eight pairs of tentacular cirri present with cirratophores. Parapodia uniramous. Setae sickle-shaped. Total segments 16. Proboscis unarmed. Segments distinct at the sides.

Occurrence in Indian waters. Gulf of Mannar, Port Blair, West Indian Ocean.

Distribution outside Indian waters. New Caledonia, Philippine Islands, Australia.

Remarks. These worms were collected along with *Harmathoe ampullifera.*

Family Nereidae

Species 6. **Lycastis indica** Southern 1921 (Plate 3, figs. 6a & 6b)

Lycastis indica Southern 1921, p. 578; Horst 1924, p. 4; Fauvel 1930a, p. 19; 1932, p. 82; Aziz 1938, p. 27; Fauvel 1940, p. 257; 1953, p. 167; Ghosh 1963, p. 240; De Silva 1965, p. 5.

Habitat. This species is an euryhaline form. It was collected from Sattankuppam, Lighthousekuppam and Edamani on the Pulicat Lake.

Description. Length 30 to 40 mm and consists of about 130 setigerous segments. Proboscis without paragnaths. Jaws possess nine teeth. Feet uniramous. In larger specimens, the dorsal cirri are long and finger-shaped. The dorsal cirri consist of a few homogomph spinigerous setae. The ventral tuft bears both heterogomph, spinigerous and heterogomph falcigerous setae.

Occurrence in Indian waters. Chilka Lake, Salt lakes (Calcutta), Cochin, Madras, Travancore, Kilakarai, Waltair and Porto-Novo.

Distribution outside Indian waters. Not known.

Remarks. Southern (1921) describes the dorsal longitudinal groove ending in a pit, but the Pulicat species do not show this pit.

Species 7. **Nereis chilkaensis** Southern 1921 (Plate 3, fig. 7)

Nereis chilkaensis Southern 1921, p. 584; Fauvel 1932, p. 94; Panikkar & Aiyar 1937, p. 293; Fauvel 1940, p. 258; 1953, p. 185; De Silva 1965, p. 543; Parulekar 1971, p. 739.

Habitat. This species is available in almost all regions of the Pulicat Lake except at the pass. It lives in burrows and occasionally comes out to the surface of the water.

Description. Length 50-75 mm and consists of about 75 segments. Characters are very similar to those of Southern's (1921) description. Feet biramous. Each foot bears about 40-50 setae in general. Variations may occur due to the varying degrees of sexual maturity.

Occurrence in Indian waters. Chilka Lake, Ennur backwater, Pamban, Madras coast and Travancore.

Distribution outside Indian waters. Sri Lanka.

Remarks. The colour of the worm varies in different areas of the lake.

Species 8. **Tylonereis fauveli** Southern 1921 (Plate 3, figs. 8a & 8b)

Tylonereis fauveli Southern 1921, p. 582; Fauvel 1930a, p. 19; 1932, p. 84; 1953, p. 169.

Habitat. It was collected at the following stations : Venadu, Berupet, Sriharikota, Atakanitippa and Royduruah.

Description. Length 40-80 mm and consists of about 125 segments. Eyes black. Tentacles, palps and tentacular cirri well developed. Feet biramous, setae arranged in three groups. Anal segment bright red in colour.

Occurrence in Indian waters. Chilka Lake and Pamban.

Distribution outside Indian waters. Mergui.

Remarks. This species has more resemblance to *Tylonereis bogoyawlonskyi* Fauvel (1911), but it differs from the latter in having a bilobed ventral setigerous neuropodium, instead of a trilobed one. The worms are pale pink in colour.

Family Eunicidae

Species 9. **Marphysa gravelyi** Southern 1921
(Plate 3, fig. 9)

Marphysa gravelyi Southern 1921, p. 617; Gravelyi 1927, p. 19; Fauvel 1932, p. 142; Aiyar 1933, p. 207; Fauvel 1953, p. 246; Krishnamurthy 1963, p. 97; Pillai 1965, p. 110-177; Cheriyan 1966, p. 44.

Habitat. These worms live in long burrows in muddy bottom of the Pulicat Lake. Their burrows are not vertical but pass through the soil irregularly in various directions. The openings of their burrows can be easily located by the presence of a circular ridge of fine sand all round. During breeding season one can notice the large cucumber-shaped egg mass of jelly, attached to the mouth of each burrow. These worms were collected from the stations Sattankuppam, Lighthousekuppam, Edamani, Kottaikuppam lock, Avarivakkam, Dhonirevu, Annamalaicheri, Moosamani lock, Arangam, Chunnambukulam, Arambakkam, Irakkam, Malan, Dugirajapatnam and Royduruah.

Description. Large specimens measure about 300 mm and carry about 500 segments. Anterior end slightly cylindrical up to the 7th segment behind which it is depressed. Anterior region greenish in colour, posterior region blood-red in colour. Gills vary from blood-red to pale yellow. Out of the five tentacles the middle one is the longest. In general, two eyes present in young individuals. Two pairs of anal cirri, of which one pair larger than the other. Dental apparatus similar to Southern's (1921) description. Feet highly vascularised; setae arranged in two groups; capillary type. Their length varies very much. The blades very minutely serrated.

Occurrence in Indian waters. Chilka Lake, Adyar estuary, Ennur backwaters, Vellar estuary and Cochin harbour area.

Distribution outside Indian waters. Philippines and Indonesia.

Remarks. Eyes are usually said to be absent in adults, but they are well developed in the adults of Chunnambukulam and Pulincheri stations. However, adults from Edamani, Lighthousekuppam and Sattankuppam do not possess eyes. This is an instance of intraspecific variation.

Species 10. **Diopatra neapolitana** Delle Chiaje 1841
(Plate 3, fig. 10)

Diopatra neapolitana Delle Chiaje, 1841; Mc Intosh 1903, p. 128; Crossland 1903, p. 132; *Diopatra amboensis* Willey 1905, p. 274;*Diopatra variabilis* Southern 1921, p. 611; *Diopatra neapolitana* Fauvel 1923, p. 419; 1930, p. 29; 1932, p. 144; 1933, p. 28; Monro 1933, p. 293; Aziz 1938, p. 39; Fauvel 1953, p. 252; Tebble 1955, p. 116; Pillai 1961, p. 13; Cheriyan 1966, p. 45; *Diopatra variabilis* Hartman 1974, p. 223.

Habitat. It was collected at the Pulicat Pass, Karimanal, Kottaikuppam lock, Kulathumedu and Pakkam.

Description. Purple-green in colour. Up to 250 mm and consists of about 320 segments. Out of the five occipital tentacles the median one can be stretched up to the middle of the 10th segment. All tentacles bear cirratophores. Eyes absent. Gills begin from the fourth foot only. Gill filaments spirally arranged. There is

no variation in the dental apparatus from Southern's description. The tube is membranous and partly buried in sand, the upperpart thick, tough and more or less encrusted with broken pieces of molluscan shells.

Occurrence in Indian waters. Gangetic delta, Orissa coast, Madras coast, Gulf of Mannar and Cochin harbour area.

Distribution outside Indian waters. Pacific Ocean, China Sea, Gulf of Siam, Arabian Sea, Gulf of Oman, Persian Gulf, Red Sea, Atlantic Ocean and the Mediterranean Sea.

Remarks. According to Fauvel (1953), there is not much difference between *Diopatra neapolitana* Delle Chiaje 1841, and *Diopatra variabilis* Southern 1921 except for the teeth in comb setae.

Species 11. **Lumbriconereis simplex** Southern 1921
(Plate 3, figs. 11a & 11b)

Lumbriconereis simplex Southern 1921, p. 625; Fauvel 1953, p. 264; Cheriyan 1966, p. 46.

Habitat. Available at Dhonirevu only and is collected along with *Euclymene annandalei.*

Description. Prostomium conical. Eyes, palps and tentacles absent. Feet highly vascularised. Parapodia absent in the first two segments. Setae simple winged, capillary type. There is not much variation in the pharyngeal complex from Southern's (1921) description. Length 15 to 30 mm., breadth about 2 mm.

Occurrence in Indian waters. Saltwaters of Calcutta, Chilka Lake and Cochin harbour.

Distribution outside Indian waters. Not known.

Remarks. According to Southern (1921), there is a dark amber coloured spot near the base of each foot. Such spots are not observed in the Pulicat forms.

Species 12. **Lumbriconereis polydesma** Southern 1921
(Plate 3, figs. 12a & 12b)

Lumbriconereis polydesma Southern 1921, p. 632; Panikkar and Aiyar 1937; Fauvel 1953, p. 264.

Habitat. Available only at Dhonirevu.

Description. Prostomium round; eyes absent. Two achaetous rings between the head and 1st setigerous segment. Feet increase in size up to the 10th segment and then taper gradually towards the posterior end. Hooks present from the 29th feet. Hooks or crochets have two broad wings over the tip with delicate striations. The setae are stout winged capillaries.

Occurrence in Indian waters. Chilka Lake.

Distribution outside Indian waters. Not known.

Remarks. According to Southern (1921), there is a small patch of pigment near the posterior border of the head, a little on the right side of the median line. Such a pigment patch is not observed in the Pulicat forms.

Family Glyceridae

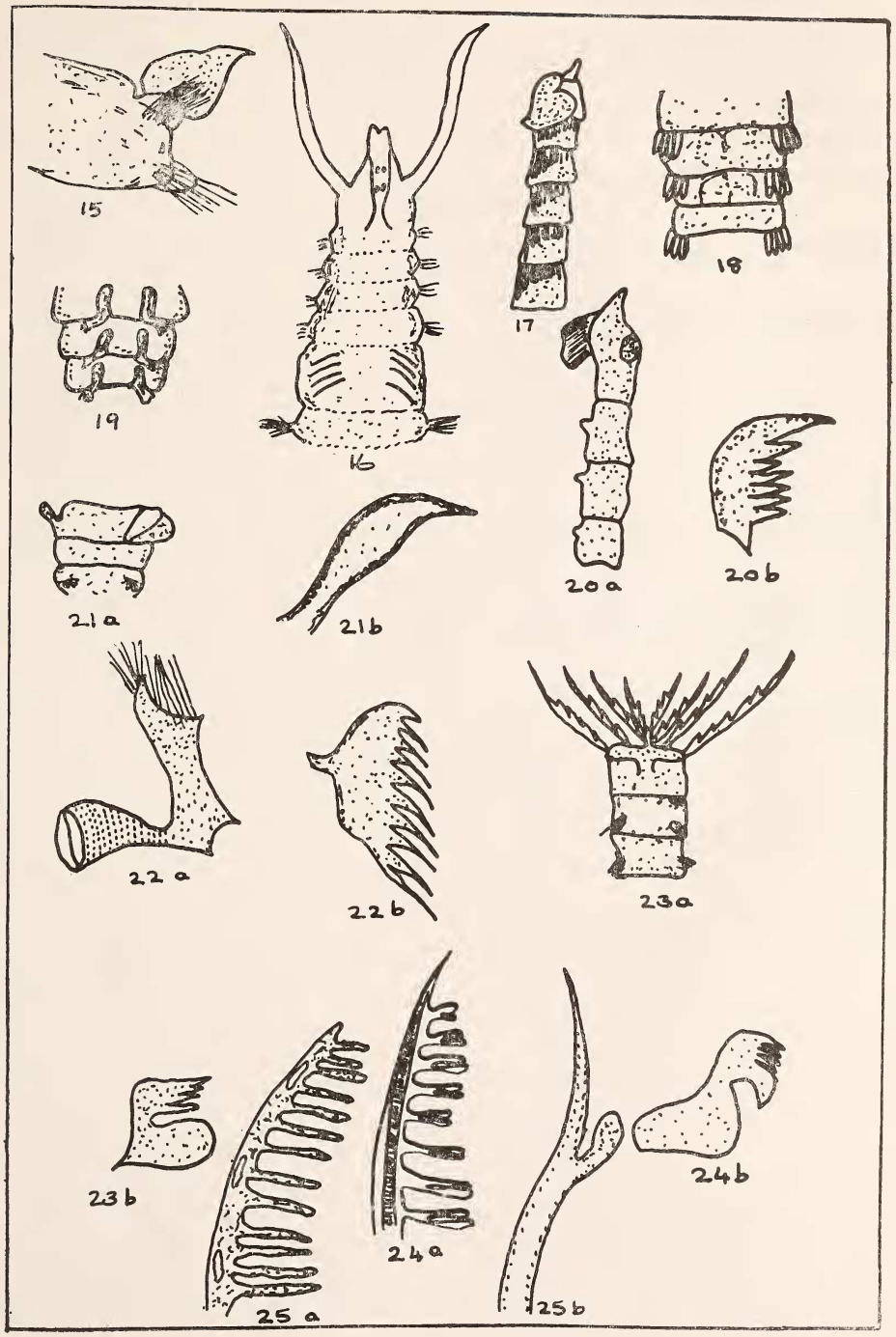
Species 13. **Glycera alba** Rathke 1843
(Plate 3, figs. 13a & 13b)

Glycera alba Ehlers 1868, p. 661; Moore 1903, p. 464; Izuka 1912, p. 247; var. *cochinensis* Southern 1921, p. 627; Fauvel 1923, p. 385; Gravely 1927, p. 9; Fauvel 1932, p. 126; Aziz 1938, p. 31; Fauvel 1940, p. 261; 1953, p. 292; Cheriyan 1966, p. 47; Parulekar 1971, p. 745.

Habitat. This form is confined to Pulicat Pass (sandy beach) only.

Description. Length 50 to 60 mm about 100 setigerous segments. Body rounded, prostomium conical and pointed with four small tentacles. Proboscis with four hooked jaws and well developed papillae. Gills simple and inserted on the dorsal side of the parapodia. Anal segment bears a pair of long tapering cirri. Dorsal setae simple, ventral setae compound.

Occurrence in Indian waters. Ganjam coast, Cochin backwater and Mormugoa Bay.



(*see* captions overleaf)

Captions to Plate 4

Prionospio krusadensis Fauvel, 1929
Fig. 15 — Median parapodium.

Polydora ciliata Johnston, 1838
Fig. 16 — Anterior end, Dorsal view.

Heteromastus similis Southern, 1921
Fig. 17 — Anterior end, side view.

Barantolla sculpta Southern, 1921
Fig. 18 — Dorsal view of segments with branchiae.

Branchiocapitella singularis Fauvel, 1932
Fig. 19 — Dorsal view of segments with branchial lobes.

Euclymene annandalei Southern, 1921
Fig. 20a — Anterior end, lateral view;
Fig. 20a — Uncinus of the 10th segment.

Clymene (*Euclymene*) *insecta* Ehlers, 1904
Fig. 21a — Anterior end, side view;
Fig. 21b — Acicular hook.

Amphicteis gunneri Sars, 1851
Fig. 22a — Thoracic foot with dorsal cirrus and pinnules;
Fig. 22b — Thoracic uncinus.

Laonome indica Southern, 1921
Fig. 23a — Anterior end, Dorsal view;
Fig. 23b — Thoracic uncinus.

Potamilla leptochaeta Southern, 1921
Fig. 24a — Tip of a gill;
Fig. 24b — Avicular uncinus.

Hydroides norvegica Gunnereus, 1768
Fig. 25a — A single radiole enlarged;
Fig. 25b — Baynet shaped bristle.

Distribution outside Indian waters. Red Sea, Atlantic Ocean and Indian Ocean.

Remarks. The worms are milky white in colour.

SEDENTARIA

Family Spionidae

Species 14. **Nerine cirratulus** Delle Chiaje 1828 (Plate 3, figs. 14a & 14b)

Nerine cirratulus Fauvel 1927a, p. 36; 1953, p. 312; Day 1962, p. 648; De Silva 1965, p. 553.

Habitat. These forms are available only on the sandy shores of the Kottaikuppam lock but completely absent in the muddy areas.

Description. Worms bright red up to the anterior 30 segments, rest bluish green in colour. Length 30-50 mm. Prostomium with two long tentacle-like palps. A single occipital tentacle-like keel. Four large eyes arranged in a single transverse row. Gills begin from the second setigerous segment, absent in the few posterior segments. Dorsal lamellae long in the anterior region but short in the posterior region. Ventral lamellae narrow. Feet biramous and possess winged capillary setae. The hooded hooks begin from the 30th segment. The tip of the hooks is bidentate. Their number varies in various segments.

Occurrence in Indian waters. Vishakapatnam channel, Sri Lanka, Indian Ocean.

Distribution outside Indian waters. Atlantic Ocean, Mediterranean Sea and Madagascar.

Remarks. This form differs from Fauvel's (1953) description in the following characters.

1. The colour of the Pulicat form is red up to the first 30 segments and the rest of the segments are bluish green in colour, but the whole worm is bluish green in colour according to Fauvel.
2. Four eyes are arranged in a transverse row in the Pulicat forms. They are arranged in a trapezium according to Fauvel's description.
3. The posterior occipital peak is not well developed in the Pulicat forms. According to Fauvel's description, this reaches upto the second segment.

Species 15. **Prionospio krusadensis** Fauvel 1929 (Plate 4, fig. 15)

Prionospio krusadensis Fauvel 1929, p. 182; 1930, p. 38; 1953; p. 326.

Habitat. This form is available only in the sandy shores of the Pulicat Pass.

Description. Body slender, anterior region slightly enlarged. Prostomium long and rounded. Four small eyes arranged in a trapezium. Branchiae arise from the second setigerous segment onwards. Gills large and oval in shape. Setae are capillary. Ventral hooks begin from the 18th segment onwards. Dorsal hooks begin from the 40th foot. Hooks bear three teeth. Median anal cirrus present. Length 30 to 50 mm. Breadth about 2 mm.

Occurrence in Indian waters. Gulf of Mannar, Krusadai Island.

Distribution outside Indian waters. Not known.

Remarks. These forms are milky white in colour but turn yellow in alcohol.

Species 16. **Polydora ciliata** Johnston 1838 (Plate 4, fig. 16)

Polydora ciliata Fauvel 1927a, p. 49; Panikkar and Aiyar 1937; p. 293; Fauvel 1953, p. 319.

Habitat. This species was collected from the oyster bed area, along with serpulids and sabellids.

Description. Prostomium slightly notched in front and prolonged backwards upto the 3rd segment. Four small eye-spots present on dorsal side. No dorsal setae on the 1st setigerous segment. Ventral capillary setae well developed. Ventral bidentate hooks present on the

7th setigerous segment. Gills from the 7th segment onwards.

Occurrence in Indian waters. Chandipore, Orissa coast and Mangalore coast.

Distribution outside Indian waters. Australia, Indo-China, Red Sea, Atlantic Ocean, Mediterranean Sea and Falkland Islands.

Remarks. Though they are small in size (25mm/1mm), they are capable of producing mud-blisters in the mantle of the edible oyster, *Crassostrea madrasensis* (Stephen, 1978b). They are considered as pests of bivalves. Their burrow is U-shaped. Although another closely related species *Polydora kempi* was recorded by Chacko *et al.* (1953) in Pulicat Lake, during the course of the present investigation over a period of seven years it was not possible to record this species.

Family Capitellidae

Species 17. **Heteromastus similis** Southern 1921 (Plate 4, fig. 17)

Heteromastus similis Southern 1921, p. 640; Gravely 1927, p. 26; Fauvel 1930a, p. 46; 1932, p. 195; 1953, p. 366; De Silva 1965, p. 554.

Habitat. This is widespread in Pulicat Lake.

Description. Bright red in colour and consist of about 200 to 220 segments. Length 60 to 70 mm. The anterior end enlarged and gradually tapers towards the tail. Peristomium long and achaetous. Thorax of 11 segments. Segment two to the sixth possess short capillary setae. Gills absent. Anal segment bears a slender clavate tail. Posterior segments possess dorsal hooks in each foot. The hook has two large teeth and one small one.

Occurrence in Indian waters. Chilka Lake, Vishakapatnam and Gulf of Mannar.

Distribution outside Indian waters. Teleh-Sap, Gulf of Siam.

Remarks. These are very closely related to *Heteromastus filiformis* Claperede (1864). The head as well as the arrangement and structure of the setae are almost identical. In *H. filiformis,* the anterior abdominal segments are much longer than the thoracic segments, whereas in *H. similis* the segments do not differ in length.

Species 18. **Barantolla sculpta** Southern 1921 (Plate 4, fig. 18)

Barantolla sculpta Southern 1921, p. 643; Fauvel 1932, p. 196; 1953, p. 370.

Habitat. These forms were collected from Gunankuppam along with *Heteromastus similis* from the dark mud.

Description. Reddish brown in colour, about 50 mm long by 2 mm. Total number of segments about 60. Body wider near fourth or fifth segment. Eyes absent. First four segments slightly tassellated. Segments two to seven have only capillary setae. Segments eight to twelve possess long crochets. These crochets are short in the abdominal segments. Branchiae arise from the 56th segment onwards. They lie under the dorsal parapodial lobes. Number of branchiae is more towards the anal end. Anal cirrus single and median. 12 thoracic segments.

Occurrence in Indian waters. Barantolla near Calcutta.

Distribution outside Indian waters. Teleh-Sap, Gulf of Siam.

Remarks. The head is contracted and withdrawn under the peristomium. According to Southern (1921), there are 12 thoracic segments, but in Pulicat forms they are not very distinct from the abdominal segments.

Species 19. **Branchiocapitella singularis** Fauvel 1932 (Plate 4, fig. 19)

Branchiocapitella singularis Fauvel 1932, p. 197; 1953, p. 371; De Silva 1965, p. 555; Pillai 1965, p. 110-177.

Habitat. These worms are available only in

the dark sand near the Lighthousekuppam area.

Description. Total length 50 to 60 mm/ 2 mm. Body slender and slightly enlarged in the thorax. Seven thoracic segments. Dorsal and ventral hooks start from the tenth segment onwards. Gills present nearer the anal segments only. Pygidium ends in a bilobed knob.

Occurrence in Indian waters. Porto-Novo and Vishakapatnam.

Distribution outside Indian waters. Sri Lanka.

Remarks. The copulatory spines described by Fauvel (1953) are not seen on the eighth and ninth segments.

Family Maldanidae

Species 20. **Euclymene annandalei** Southern 1921

(Plate 4, figs. 20a & 20b)

Euclymene annandalei Southern 1921, p. 648; Fauvel 1932, p. 199; 1953, p. 377.

Habitat. They live in sandy tubes and from the dark muddy areas of the Pulicat Lake, namely from Sattankuppam, Lighthousekuppam, Avarivakkam, Dhonirevu and Moosamani Lock.

Description. Length 20 to 60 mm. Total segments 21, of which two achaetous. Head carries the cephalic plate. Numerous ocelli. Caudal funnel bears short, bluntly rounded cirri. Parapodia very close to Southern's description.

Occurrence in Indian waters. Vellar Estuary, Kakinada Bay and Chilka Lake. Camorta, Andaman and Nicobar Islands.

Distribution outside Indian waters. Amoy (China).

Remarks. The sandy tubes are not as brittle as Southern (1921) has stated. The segmentation is very distinct.

Species 21. **Clymene (Euclymene) insecta** (Ehlers) 1904

(Plate 4, figs. 21a & 21b)

Clymenella insecta Ehlers 1904, p. 54; *Paraxillella insecta* Augener 1926a, p. 192; *Clymene* (*Euclymene*) *insecta* Fauvel 1932, p. 199; 1953, p. 377; Krishnamurthy 1963, p. 95.

Habitat. This also lives in sandy tubes. This is available only from the Chunnambukulam area.

Description. Bright red in colour. Body delicate, total number of segments about 22. Nuchal grooves not clearly seen. Prostomium does not bear any appendages other than the cephalic plate. The caudal funnel possesses a number of short cirri, of which one is longer than the others. The first three setigerous segments possess acicular hooks. Fourth to seventh segments bear hooded hooks with two to three teeth. Capillary and capillary wing setae present from the eighth segment onwards.

Occurrence in Indian waters. Vishakapatnam and Madras.

Distribution outside Indian waters. New Zealand.

Remarks. Caudal funnel is similar to that of *Euclymene annandalei*, but it differs in having a longer median ventral cirrus. In *E. annandalei*, the median ventral cirrus is slightly stouter than in others.

Family Ampharetidae

Species 22. **Amphicteis gunneri** Sars 1835

(Plate 4, figs. 22a & 22b)

Amphicteis gunneri Malmgren 1865, p. 365; *Amphicteis japonica* McIntosh 1885, p. 431; *Amphicteis gunneri* Fauvel 1897, p. 411; Hessle 1917, p. 116; 1927, p. 231; 1932, p. 216; Monro 1933, p. 313; Fauvel 1953, p. 407; Day 1967, p. 695.

Habitat. These forms were collected from the crevices of oyster shells.

Description. Body divided into thorax and abdomen. Thorax bears 17 segments and abdomen bears about 15 to 25 segments. Eyes or eye-spots completely absent. Thorax possesses dorsal capillary setae and ventral uncinigerous pinnules. Abdomen bears only

uncinigerous pinnules. Four pairs of gills present. Anal segment does not bear anal cirri. Tube is muddy and the length varies from 40 to 60 mm.

Occurrence in Indian waters. Bay of Bengal, Orissa coast.

Distribution outside Indian waters. Gulf of Oman, Japan, Indo-China, Atlantic Ocean, Mediterranean Sea and Antarctic Ocean.

Remarks. The worms are pink in colour. According to Fauvel (1953), there are numerous eye-spots. Pulicat forms do not possess any eye-spots.

FAMILY SABELLIDAE

Species 23. **Laonome indica** Southern 1921
(Plate 4, figs. 23a & 23b)

Laonome indica Southern 1921, p. 652; Fauvel 1953, p. 446.

Habitat. This was collected from the Kulathumedu station, from within the crevices of oyster shells.

Description. Very thin, about 50 segments. Posterior ten segments shorter than anterior ones. Only four pairs of branchial lobes instead of seven as Southern (1921) describes, but they are symmetrical. Eyes completely absent. Thorax composed of about six segments. The abdominal segments possess uncini. The arrangement of setae agrees with Southern's (1921) description.

Occurrence in Indian waters. Chilka Lake.

Distribution outside Indian waters. Not known.

Remarks. The colour is brown in live condition, but it turns pale when preserved in 5% formalin.

Species 24. **Potamilla leptochaeta** Southern 1921
(Plate 4, figs. 24a & 24b)

Potamilla leptochaeta Southern 1921, p. 651; Gravely 1927, p. 27; Fauvel 1932, p. 231; Aziz 1938, p. 47; Fauvel 1953, p. 449; De Silva 1965, p. 559.

Habitat. It is commonly available at Moosamani lock, Lighthousekuppam and at Gunankuppam stations.

Description. 20-30 mm long. Prostomium bears about 10 to 12 branchiae. Each branchia possesses about 40-45 filaments. Gills without eyes. Colour of the worm differs from Southern's (1921) description. All the worms are pale green with white stripes. The arrangement of setae agrees with Southern's (1921) description. Tube is made up of mud and sand.

Occurrence in Indian waters. Chingrighatta near Calcutta and Vishakapatnam.

Distribution outside Indian waters. Malay Archipelago.

Remarks. This species closely resembles *Potamilla ceylonica* Augener (1926), but it differs from *P. ceylonica* with regard to the arrangement of setae in both the thoracic as well as in the abdominal segments.

FAMILY SERPULIDAE

Species 25. **Hydroides norvegica** Gunnerus 1768
(Plate 4, figs. 25a & 25b)

Eupomatus elegans Haswell 1883, p. 633; *Hydroides multispinosa* Marenzeller 1884, p. 21; *Hydroides norvegica* Pixell 1913, p. 74; *Hydroides multispinosa* Augener 1914, p. 139; *Hydroides norvegica* Fauvel 1927a, p. 356; 1932, p. 242; 1953, p. 458; Pillai 1960, p. 12.

Habitat. Large numbers of the tubes of this species were collected from the crevices of oyster shells at the Kulathumedu station, but worms were present only in some tubes.

Description. 20-25 mm long. Tubes white, cylindrical and more or less erect. Gills around the mouth, bearing numerous radicles with two rows of barbules. Thorax possesses dorsal capillary setae and ventral uncinigerous tori, but the abdominal segments possesses dorsal